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A NEW BURROWING CRAYFISH FROM NORTH  
CAROLINA (DECAPODA, ASTACIDAE)

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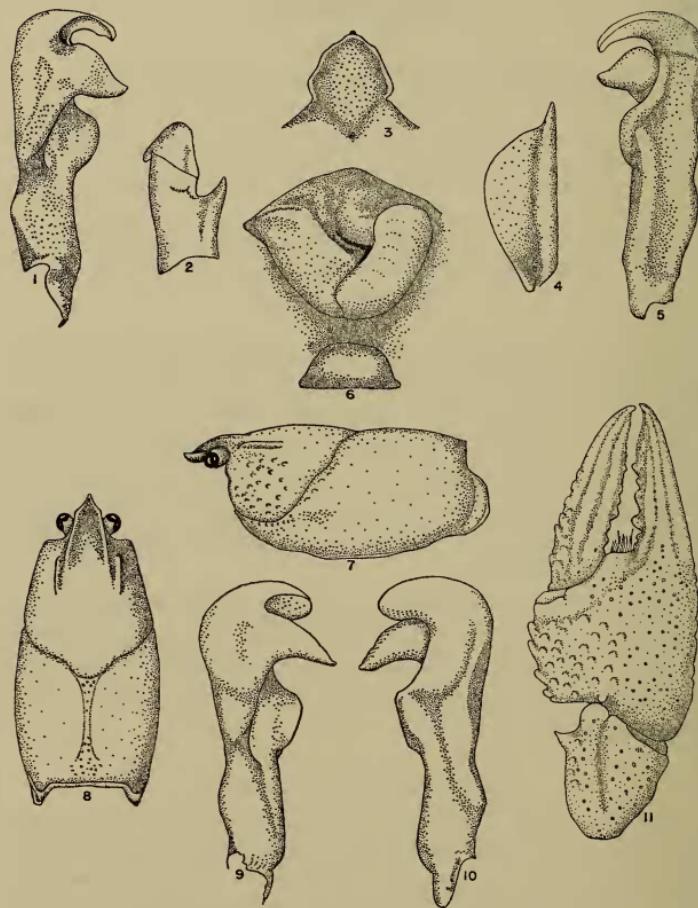
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This new crayfish is known from a single locality within the city limits of Greensboro, Guilford County, North Carolina. Here, in a rolling terrain some 500 yards from the nearest creek, the members of a colony construct complex, branching burrows in a sandy-clay soil in which the water table varies from a few inches to two feet below the surface of the ground. Much of the area has been cut over and has been converted to lawns and gardens.

This locality, in the Cape Fear River system, is in the same drainage basin and is less than 30 miles north and 40 miles west of localities from which another, distantly related, burrowing species, *Cambarus reduncus* Hobbs (1956: 61), has been reported.

***Cambarus catagius* new species**

*Diagnosis:* Body pigmented, eyes well developed. Rostrum with convergent lateral margins and with distinct acumen although lacking marginal spines at base of latter. Areola 17 to 23 times longer than broad and comprising 37 to 40 per cent of entire length of carapace. Lateral surface of carapace with two or three small tubercles immediately caudal to cervical groove. Suborbital angle absent. Postorbital ridges without spines or tubercles. Antennal scale less than one-half as broad as long. Chela with two rows of tubercles along inner margin of palm; outer margin of hand costate and both fingers with well-defined longitudinal ridges on upper surfaces. First pereiopod (Figs. 1, 5) of first form male with central projection recurved at angle slightly greater than 90 degrees and not markedly tapering distally; tip of projection never extending proximad of its base; mesial process bulbiform, tapering distally to subacute tip. Annulus ventralis (Fig. 6)



Figs. 1-11. *Cambarus catagius* new species. 1, Mesial view of first pleopod of first form male. 2, Basis and ischium of third pereiopod of first form male. 3, Epistome. 4, Antennal scale. 5, Lateral view of first pleopod of first form male. 6, Annulus ventralis. 7, Lateral view of carapace of first form male. 8, Dorsal view of carapace of first form male. 9, Mesial view of first pleopod of second form male. 10, Lateral view of first pleopod of second form male. 11, Dorsal view of distal podomeres of cheliped of first form male.

with sclerotized caudal V-shaped portion movable and marked by a tilted L-shaped sinus.

*Holotypic male, form I:* Body subovate, slightly compressed laterally. Abdomen narrower than thorax (10.8 and 13.8 mm) in widest parts. Greatest width of carapace greater than depth at caudodorsal margin of cervical groove (13.8 and 12.2 mm). Areola narrow (22.6 times longer than wide), with widely scattered punctations, only one or two across narrowest portion. Cephalic section of carapace about 1.5 times as long as areola (length of areola about 40 per cent of entire length of carapace). Rostrum excavate above with convergent, thickened margins; acumen short, well defined and with a slightly upturned, cornous, tuberculiform tip; marginal spines or tubercles absent. Upper surface with usual submarginal row of tubercles and with a few prominent tubercles near midbasal portion. Subrostral ridges moderately well developed and visible in dorsal aspect almost to base of acumen.

Postorbital ridges weak, grooved laterally, and terminating cephalically without spines or tubercles. Suborbital angle absent. Branchiostegal spine absent but represented by small tuberculiform prominence. Row of small tubercles on side of carapace immediately caudal to cervical groove. Carapace punctate dorsally and weakly granulate laterally; granules more prominent in lateral area cephalic to cervical groove. Abdomen shorter than carapace (24.7 and 28.1 mm). Cephalic section of telson with two spines in each caudolateral corner.

Epistome (Fig. 3) broader than long with slightly elevated margins and with small cephalomedian projection. Antennule of usual form with small spine on lower surface of basal segment. Antenna extending caudad to third abdominal segment. Antennal scale (Fig. 4) broadest slightly distal to midlength; lamellar portion distinctly broader than lateral thickened portion, latter terminating in acute spine.

Right chela somewhat depressed but with palm inflated; distal two-thirds of outer margin of hand costate. Upper and lower surfaces of palm punctate laterally and tuberculate mesially. Inner margin of palm with two rows of tubercles—more mesial row of five, lateral row of four. Lower surface of palm with four conspicuous tubercles—two on ridge at base of dactyl and two proximal to them. Fingers slightly gaping and both with well-defined longitudinal ridges above and below, flanked by grooves containing deep setiferous punctations. Opposable margins of both fingers with six tubercles along proximal two-thirds, third from base in both rows largest. Distal portion of opposable margins of both fingers with single row of minute denticles interrupted by more distal tubercles. Mesial margin of dactyl with row of six tubercles, progressively more squamous distally; proximally row flanked by other tubercles, and distally by linear arrangement of seven setiferous punctations.

Carpus of right cheliped longer than broad, with distinct, oblique longitudinal furrow above; entire podomere punctate except for mesial

TABLE 1. Measurements (mm) of *Cambarus catagius*.

	Holotype	Allotype	Morphotype
Carapace:			
Height	12.2	12.9	12.2
Width	13.8	15.1	13.8
Length	28.1	31.6	28.0
Areola:			
Width	0.5	0.7	0.5
Length	11.3	12.4	11.2
Rostrum:			
Width	4.2	5.0	4.2
Length	5.8	6.4	5.3
Chela:			
Length of inner margin of palm	5.7	6.2	5.6
Width of palm	8.6	9.9	9.4
Length of outer margin of hand	19.1	20.6	18.4
Length of dactyl	12.1	14.0	12.2

surface. Mesial surface with prominent spine and small proximal tubercle; lower distal margin with usual two tubercles.

Merus of right cheliped with mesial and lateral surfaces sparsely punctate. Upper surface with three subdistal tubercles; proximal two prominent, distal one less conspicuous. Lower lateral margin with row of five tubercles and lower mesial margin with row of ten. Row of four tubercles on ischium corresponding to mesial row on merus.

Hook on ischia of third pereiopods only (Fig. 2); hooks simple and not opposed by tubercle on basis. Coxa of fourth pereiopod with prominent caudomesial protuberance; that of fifth pereiopod with small knoblike prominence.

Sternum moderately deep between third, fourth, and fifth pereiopods and supporting heavy mat of plumose setae between bases of third and fourth pereiopods.

First pleopod (Figs. 1, 5) symmetrically arranged and reaching coxa of third pereiopod when abdomen is flexed. (See diagnosis for description.)

*Morphotypic male, form II:* Differs from holotype in following respects: areola without punctations in middle third of its length; branchiostegal spines obsolete; only one or two tubercles on sides of carapace immediately caudal to cervical groove; cephalic section of telson with only one spine in caudodextral corner; epistome proportionately slightly longer than in holotype; antennae extending caudad only to second abdominal segment; mesial row of tubercles on palm consisting of five on right and seven on left chela, and respective lateral rows of three and four (right chela atypical, perhaps regenerated); opposable margin

of fingers of left chela with five tubercles; opposable margin of dactyl of right chela with eight tubercles; lower lateral margin of merus of left cheliped with row of three tubercles and mesial margin with row of eight; ischia of both chelipeds with only two tubercles on lower margin; hooks on ischia of third pereiopods and prominences on coxae of fourth and fifth reduced in size but similar to those of holotype. First pleopod (Figs. 9, 10) without corneous elements; central projection rounded distally and broader and shorter than in holotype; mesial process elongate, tapering, and its axis forming angle of about 50 degrees with that of main shaft of appendage.

*Allotypic female*: Differs from holotype in following respects: rostrum narrower, except at base, and more acuminate; right branchiostegal spine absent; antennal scale less rounded mesially with inner and outer margins subparallel for greater part of length; palm of both chelae with mesial row of six tubercles; opposable margin of dactyl of chela with row of seven tubercles; mesial margin of carpus of cheliped with only one large tubercle, smaller proximal tubercle almost obsolete; lower lateral margin of carpus of both chelipeds with row of four tubercles and lower mesial margin of right with row of ten, that of left with only eight; no hooks on ischia of third pereiopods and no prominences on coxae of fourth and fifth. Annulus ventralis (Fig. 6), more flexible than in most members of *Cambarus*, with heavily sclerotized caudal V-shaped sclerite marked by caudomedian, tilted, L-shaped sinus; fossa dipping below sinistral arm of V.

*Color notes*: Dorsal portion of carapace and abdomen dark brown, with very small cream or light tan flecks, fading ventrolaterally to grayish mauve; poorly-defined pinkish-tan patch immediately cephalic to cervical groove on each side, and caudoventral to it, short cream-colored bar just posteroventral to groove. Margins of rostrum and postorbital ridges orange. Caudal margins and epimera of abdominal segments pinkish mauve. Chelipeds greenish tan above, pale pink below; tips of tubercles on chela pale orange to cream and lateral costae of propodus and tips of fingers orange. Remaining pereiopods mostly pinkish mauve but upper margins greenish-tan.

A green phase, instead of the brown one, also occurs in this species. The only differences are in substitution of olive to dark green in the brown areas described above; in these specimens, the orange markings are also decidedly more conspicuous.

*Measurements*: See Table 1.

*Type-locality*: Burrows in lawn at East Whittington Street, in the southeastern section of Greensboro, Guilford County, North Carolina (see above). This species is known only from the type locality.

*Disposition of types*: The holotypic male, form I, allotypic female, and morphotypic male, from II, are deposited in the United States National Museum (nos. 117779, 117780, 117781, respectively). Of the 19 paratypes, one male, form I, and one female are deposited in the

Museum of Comparative Zoology, and five males, form I, one male, form II, ten females, and one juvenile male are in the United States National Museum.

*Life history notes:* The three collections available were made in February, May, and June. First form males were collected in February and June, and a single female carrying eggs was found in June.

*Relationships:* *Cambarus catagius* is a member of the Bartonii Section of the genus and apparently is as closely related to *Cambarus latimanus* (LeConte, 1856: 402) as to any other species. Like *C. latimanus* and *C. reduncus*, the chela bears two rows of tubercles along the inner margin of the palm. The width of the areola approaches that of *C. reduncus*, being narrower than that of *C. latimanus*, but the first pleopod is similar to that of *C. latimanus* and markedly different from that of *C. reduncus*.

*Etymology:* The name *catagius* is derived from Greek, meaning underground, and refers to the burrowing habit of this crayfish.

*Remark:* This new crayfish was infested with two entocytherid ostracods, *Entocythere dentata* Crawford and *Ankylocythere encyla* Crawford.

#### LITERATURE CITED

HOBBS, HORTON H., JR. 1956. A new crayfish of the genus *Cambarus* from North Carolina and South Carolina (Decapoda, Astacidae). *Jour. Elisha Mitchell Sci. Soc.*, 72 (1): 61-67, 11 figs.

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